Service Manual

Hydrovar-*Watercooled*

ENGLISH

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771079022 Manual HVW1_07-VL-EN-S

ITT Industries
Engineered for life

Contents

1 Important safety instructions 4
2 Technical Data 6
3 Mounting and accessories 7
4 Electrical connection, control terminals and Display unit 12
5 Status signal and required value adjustment 13
6 Parameter setting 15
Maximum frequency 16
Minimum frequency 16
Fast Ramps 18
Slow Ramps 18
Controller or Actuator mode 19
Automatic Failure - Reset 19
Start value 20
Continuous operation 21
Power reduction 21
7 Error Messages 22
8 Maintenance and Notes 24
9 Manufacturer's Declaration 25

Follow the Pump Operating and Maintenance Instructions
We reserve the right to alter specifications

1 Important safety instructions

Read and follow the operating instructions and safety instructions carefully before starting operation! All modifications must be done by qualified technicians!

In addition to the instructions contained in this service manual please pay attention to universal safety and accident preventing regulations!

Warns that failure to observe the precaution may cause electric shock.

Warns that failure to observe the precaution may cause personal injury or damage to property.

The **Hydrovar**-*Watercooled* must be disconnected from the power supply before any work can be carried out in the electrical or mechanical part of the system.
Installation, maintenance and repair work may only be carried out by trained, skilled and qualified personnel.

Unauthorized modifications or changes to the system make all guarantees null and void.
When in operation, the motor can be stopped by remote control, whereby the **Hydrovar**-*Watercooled* and the motor remain under voltage. For safety reasons, the unit has to be disconnected from the power supply when carrying out work on the machinery as locking out the equipment by switching off the release mechanism or set value cannot prevent accidental starting of the motor.

When the **Hydrovar**-*Watercooled* is connected to power supply, the components of the power unit as well as certain components of the master control unit are also connected to the power supply.

Touching these components seriously endangers life!

Before removing the **Hydrovar**-*Watercooled* cover the system must be disconnected from the power supply. After switching off the power supply wait **at least 5 minutes** before starting work on or in the **Hydrovar**-*Watercooled* (the capacitors in the intermediate circuit are discharged by the installed discharge resistors first).
Notice: Furthermore, care must be taken not to short circuit the neighbouring components when connecting the external control wires.
Isolate open cable ends which are not in use.

The **Hydrovar**-*Watercooled* contains electronic safety devices which switch off the control element in the event of a fault, whereby the motor has zero current but remains energized and comes to a halt. The motor can also be halted by mechanical blocking. If it is electronically switched off the motor is disconnected from the mains voltage through the electronics of the **Hydrovar**-*Watercooled* but is not potential-free in the circuit.

In addition voltage fluctuations, especially power failures can cause the system to switch off itself.

Repair of faults can cause the motor to start up again!

The system may only be put into operation when it has been grounded. In addition, equipotential bonding of all pipes must be ensured.

The operating instructions must be read, understood and followed by the operating personnel. We point out that we accept no liability for damage and operating disorders which are the result of non-compliance with the operating instructions.

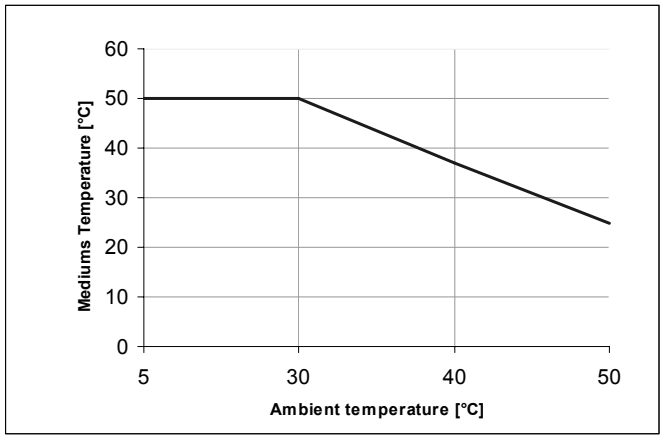
Transportation, Handling:
Check the **Hydrovar**-*Watercooled* immediately upon delivery/receipt of dispatch for damage or missing parts. If any damage is visible, inform your distributor within 8 days from the delivery date.
The unit must be transported carefully and by competent personnel.
Avoid serious impacts.
Attention: Dispose of all packing materials in accordance with local regulations.

2 Technical Data

HYDROVAR Watercooled		Power supply		Max. nominal	Weight
Type		Voltage	Frequency	motor current	[kg]
HVW 1.07	0,75 kW	220-240 V+/- 15%	48-62 Hz	4,2 A	3,3

System pressure: max. 6 bar
Motor cable length: max. 20 Meter
Overload: max. 20%
Cooling: through handled liquid (Water, Service water)
Medium temperature: max. +50°C see diagram below
Ambient temperature: 0° C ... +50°C see diagram below
Storage temperature: -25° C ... +55° C (+70°C during max. 24 hours)
Humidity: RH max. 50% at 40°C, unlimited
RH max. 90% at 20°C, max. 30 days per year
75% average per year (Class F)
Condensation is not permitted!
Air pollution: The air may contain dry dust as found in workshops where there is no excessive quantity of dust due to machines.
Excessive amounts of dust, acids, corrosive gases, salts etc. are not permitted
Altitude: max. 1000m above sea level
At sites over 1000 m above sea level, the maximum output power is derated by 1% for every additional 100m.
If the installation site is higher than 2000 m above sea level, please contact your local distributor.
Class of protection: IP 55

Temperature: Medium temperature depends on the ambient temperature

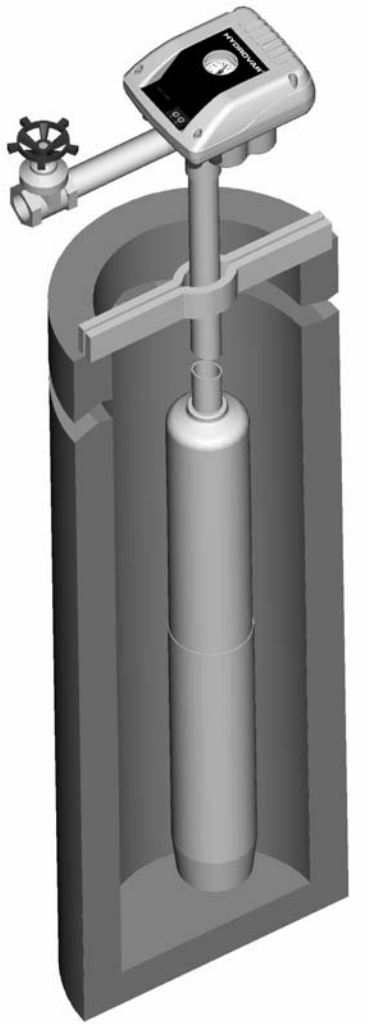


Means of protection:
Ask your power supply company which means of protection is required.
Applicable: TN systems, protective circuits, (FI) pulse current-circuit breaker

3 Mounting and accessories

The **Hydrovar**-*Watercooled* has to be directly mounted in the pressure line. The cooling of the unit is done through the handled liquid.
The **Hydrovar**-*Watercooled* has two connections with 1" female thread and one connection with 1" male thread.
The direction of the flow can be chosen in any direction.
The 3rd (unused) connection can either be closed (use incl. closing cap) or can be used as the connection for the pressure tank.

Direct mounting on the pressurized side of a dry pump



Indirect mounting in the pipe work with a submersible pump

Assembly possibilities

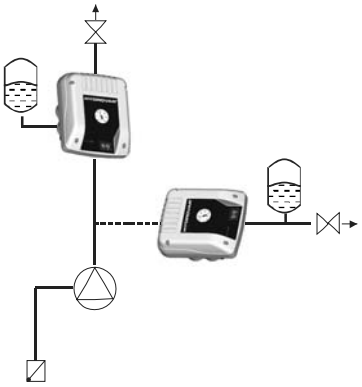
Max. 45° left

Horizontal assembly

Max. 45° right

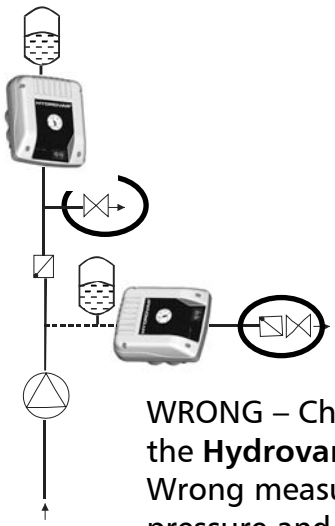
Vertical assembly

Right mounting



WRONG –
There is no flow through the **Hydrovar**-*Watercooled*
Inefficient cooling of the unit!

Possibilities for wrong mounting



WRONG – Check valve is mounted after the **Hydrovar**-*Watercooled*
Wrong measuring point for the system pressure and therefore no automatic stop of the pump at zero demand.

General information about the System

The **Hydrovar**-*Watercooled* is suitable for constant pressure control of pumps up to 6 bars set pressure. The variable speed drive can be used for service water, water supply from a well or as a booster station. The requirement for using this variable speed drive is a capable pump with an asynchronous motor suitable for a 3x230Vac supply and isolation class F.

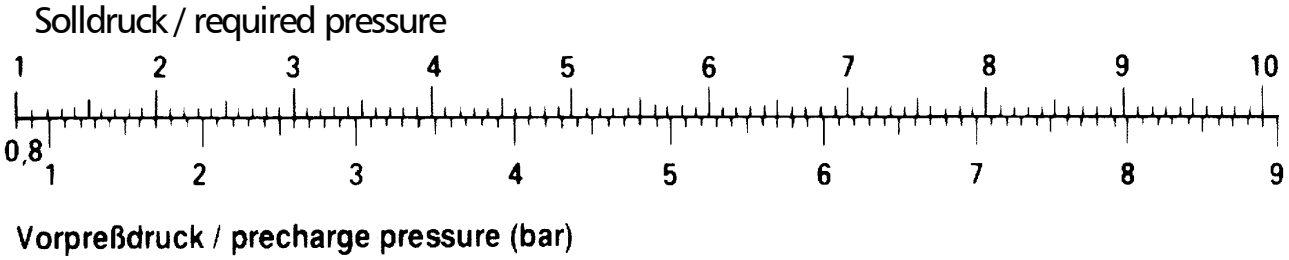
Mounting into the pressure line with pressure tank

For applications as water supply or booster with automatic shutoff it is necessary to mount a check valve and a pressure tank.
To measure or control the actual system pressure it is necessary that the check valve is mounted before the **Hydrovar**-*Watercooled*.

The pressure tank can be mounted before or after the **Hydrovar**-*Watercooled* or at the not used pipe connection. Between pressure tank and **Hydrovar**-*Watercooled* it is not allowed to mount a check valve or a pressure reduction valve to ensure storing the pressure in the system at zero demand.
With the **Hydrovar**-*Watercooled* it is not necessary to have a large pressure tank for supply purposes.
For selecting a pressure tank, make sure it is approved and suitable for the maximum system pressure. The pressure tank should have a capacity of more than 10% of the maximum system flow rate [l/min] of the pump.

Example:
Maximal capacity of the pump = 70 Liter per minute
Minimum volume of the pressure tank = 70x0.10 = 7 Liter

A certain pre-charge pressure has to be in the pressure tank when there is no water in the tank, determined by the required pressure or the start value when activated.



Special application: Constant pressure control with external release contact:

For irrigation systems the **Hydrovar**-*Watercooled* can be mounted without check valve and pressure tank, if the **Hydrovar**-*Watercooled* will be activated with an external release contact. The **Hydrovar**-*Watercooled* keeps the system pressure constant, while the external contact is closed (irrigation is on) and is switched off by the external contact when the irrigation system is not in use.

Notice:

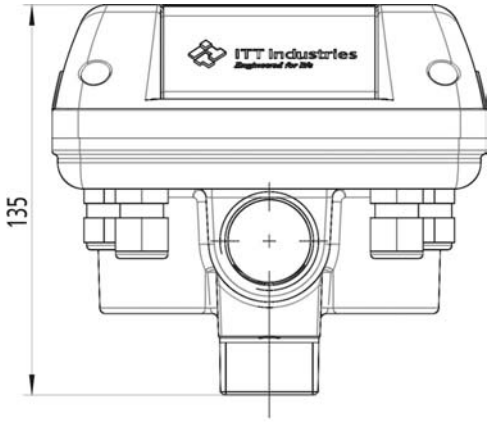
To protect the pump against air inlet from the suction side or working below an allowed incoming pressure level, it is necessary to connect an external protection unit to the release contact terminals of the unit. The **Hydrovar**-*Watercooled* shuts off when the contact will be opened and turns on if the contact will be closed.

When there is an application of sucking out water from a well or a tank there has to be used a level probe or a float switch as the low water protection.

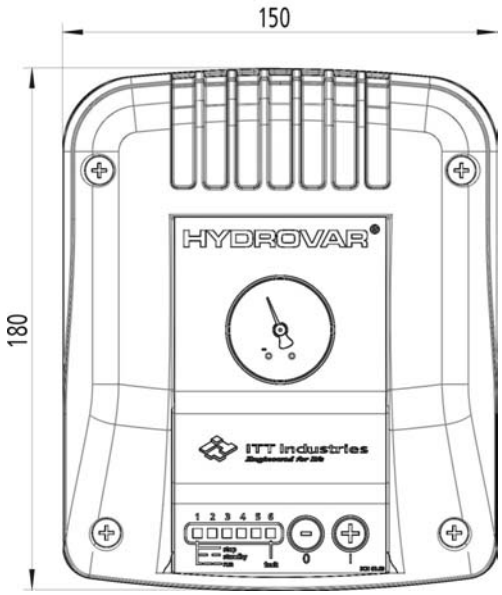
For **booster stations** a pressure switch has to be mounted for low water protection. When the pressure switch opens the contact of the **Hydrovar**-*Watercooled* will detect low water and the pump will be stopped.

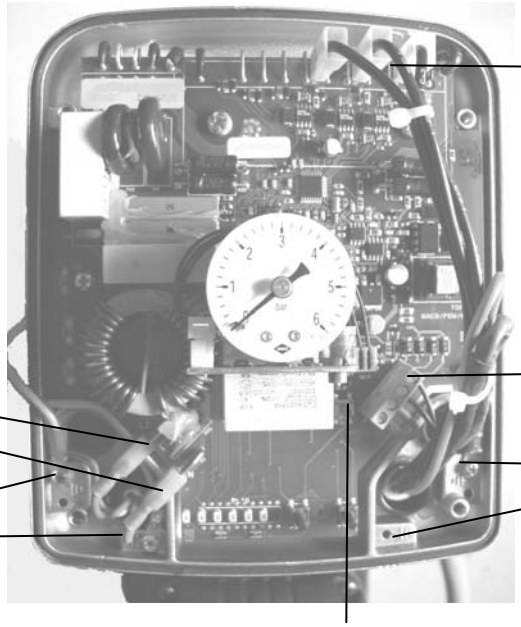
For protection against contamination inside the cooling pipe of the **Hydrovar**-*Watercooled* (e.g. at pumping of service or rain water) we recommend a filter before the unit.

Dimensions (all measures are in mm)



Drawings are not on the scale of!





4 Electrical connection, control terminals and Display unit

Do the hydraulic assembling first before starting the electrical connection.

a) Open the 4 screws of the cover and remove the top cover.
b) Connect the motor cable and the supply cable.
c) If required, connect the control cable for the external release contact and the thermistor (PTC). If they are not used; these inputs have to be bridged.

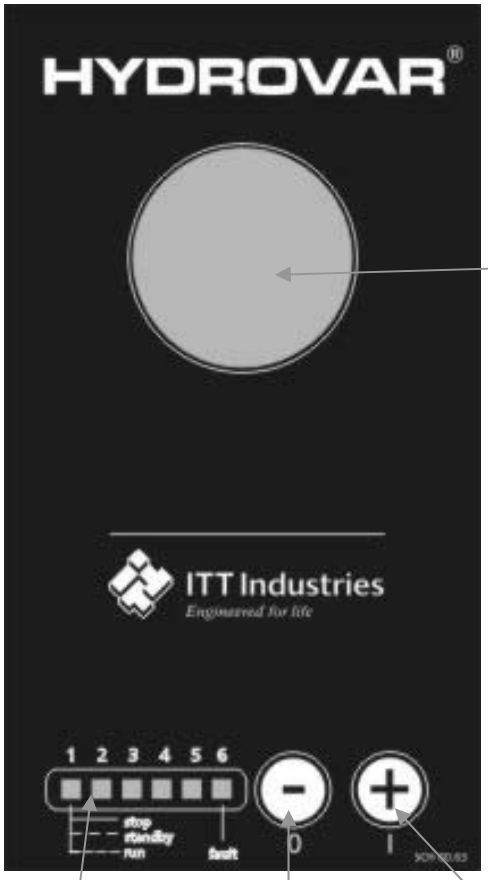
Cable gland type	Suitable cable diameter	Pieces
M20x1,5	7-13 [mm]	1
M16x1,5	4,5-10 [mm]	2
M12x1,5	3,5-7 [mm]	1

Do not connect the electronic ground with the other voltage potentials!

There is only single isolation of the control voltage. Between ground and GND of the control voltage there can occur voltage levels >100Vac! Connected relays or switches therefore have to have double isolated contacts.

Terminals: X4/ 1 GND
2 External release (On / Off)
3 GND
4 Thermistor (PTC)

Front label



Display of the system pressure

Description of the LED Signal

●	Bright
○	Dark
◉	Slow blinking
◉	Fast blinking

LED Signal Error code

Stop-Button Decrease

Start-Button Increase

5 Status signal and required value adjustment

After connecting the power supply to the **Hydrovar**-*Watercooled* the 1st LED is switched on.

To start the unit, press the (+)-button.

Fast blinking of LED 1	Pump is running
Slow blinking of LED 1	Required pressure is reached and the unit is in standby mode

To stop the unit, press the (-)-button.

Auto Start Function – Memory Function:
HVW in operation - after a power supply failure – HVW will start automatically again

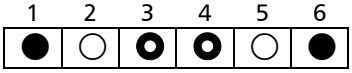
HVW in standby – after power supply failure – HVW will remain in standby mode, if the required pressure is available
- after pressure is down – HVW will start automatically.

If the unit has been stopped - stop-button has been pressed - before the power supply failure, the **Hydrovar**-*Watercooled* is also stopped after return of the supply power.

A) Controller mode - constant pressure control:

In this mode the **Hydrovar**-*Watercooled* is **controlling to a constant output pressure** independent from the required flow rate, but limited to the maximum performances of the pump. The integrated low water protection shuts off the pump when the output pressure during operating of the pump is below 25% of the stored required pressure for longer than 20 seconds. In that case the controller will shut off the pump and will show Error code 26 "Lack of water" (more information about Error codes you will find on page 22).

Adjustment of the required pressure:
Press (+) and (-) together for 3 seconds till all LEDs are illuminated.
The required pressure setting is now active and will be indicated by shining of LED 1 and 6. LEDs 3 and 4 in the centre of the LED bar are blinking alternately.



Required pressure can be changed

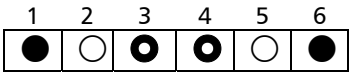
Press (+) (=increase) or (-) (=decrease) to set the required pressure. The changing of the operating pressure of the pump is shown on the manometer.

If no button is pressed for more than 10 seconds, the new setting will be saved automatically.

B) Actuator mode – Fixed speed operation:

This parameter can be selected in the parameter level 2 by setting the ACTUATOR MODE to ON (see next chapter).
In that mode the pressure controller is deactivated and a fixed speed can be adjusted.

Adjustment of the fixed speed:
Press (+) and (-) together for 3 seconds till all LEDs are illuminated.
Now the fixed speed can be set which is indicated by shining of LED 1 and 6. LEDs 3 and 4 in the centre of the LED bar are blinking alternately.



Required speed can be changed

Press (+) (=increase) or (-) (=decrease) to set the required speed.

If no button is pressed for more than 10 seconds, the new setting will be saved automatically.

In the actuator mode the pump is ramping up o the set speed by using the fast ramps. There is no automatic reduction of the speed or shut off at zero demand which could result in overheating of the pump or the **Hydrovar**-*Watercooled!*

●	Bright	○	Dark	◉	Slow blinking	⦿	Fast blinking

6 Parameter setting

While changing the parameters, the **Hydrovar**-*Watercooled* should be in operation, but can also be stopped, if the exact adjustments are known.

Important: Before entering the parameter setting these instructions have to be read carefully to prevent incorrect settings which could cause malfunction.

Parameter level 1
All parameters in that layer could be changed in their value.
The selected LED is blinking, all other LEDs are dark.

LED 1 Exit of the parameter setting, back to the main display function
LED 2 Maximum frequency
LED 3 Minimum frequency
LED 4 Control window
LED 5 Fast Ramps
LED 6 Slow Ramps

Parameter level 2
The parameters in that layer can be either activated or deactivated.
The selected LED is blinking; all other LEDs are illuminated.

LED 1 Actuator-mode
LED 2 Automatic Error-Reset
LED 3 Start value
LED 4 Configuration of the minimum speed
LED 5 Power reduction

Entrance and handling of the parameter levels

While changing the parameters, the **Hydrovar**-*Watercooled* should be in operation, but can also be stopped, if the exact adjustments are known.
Press (+) and (-) for 20 seconds, until all LEDs change from luminescent to dark to enter the parameter setting level.
Press (+) or (-) to move to the different parameters you want to change.
After selecting the right parameter, press (+) and (-) together for 3 seconds to enter the parameter for changing the value or the status. The number of shining LEDs shows the value or the status.
Press button (+) or (-) to change the value or the status.
To exit the parameter, press (+) and (-) together for 3 seconds.
To exit the parameter setting and changing back to the normal operation, select LED 1 in the first parameter level and press both buttons for 3 seconds.

●	Bright	○	Dark	◉	Slow blinking	⦿	Fast blinking

Parameter Level 1: The parameters in this layer can be changed in their value.

Maximum frequency

1	2	3	4	5	6
○	◉	○	○	○	○

This adjustment determines the maximum output frequency of the **Hydrovar**-*Watercooled* and should be adjusted according to the nominal frequency of the motor.

Press (+) and (-) together for 3 seconds to choose the parameter.

1	2	3	4	5	6		
●	○	○	○	○	○	45 Hz	
●	●	○	○	○	○	50 Hz	Default setting
●	●	●	○	○	○	55 Hz	
●	●	●	●	○	○	60 Hz	
●	●	●	●	●	○	65 Hz	
●	●	●	●	●	●	70 Hz	

Press (+) or (-) for selecting the value.
To exit the parameter, press (+) and (-) together for 3 seconds.

Settings higher than 50 Hz may overload the motor.
A setting of 10% above nominal frequency results in a maximum power consumption of 33% above the nominal power!

Press (+) to change to the next parameter.

Minimum frequency

1	2	3	4	5	6
○	○	◉	○	○	○

This adjustment enables and determines a minimum speed limit. During stopping of the **Hydrovar**-*Watercooled* the unit will ramp down with the fast ramp times below this frequency. When the constant mode at minimum speed is activated (see parameter in level 2) the pump will never operate below this speed limit.

Press (+) and (-) together for 3 seconds to choose the parameter.

1	2	3	4	5	6		
●	○	○	○	○	○	0 Hz	
●	●	○	○	○	○	20 Hz	
●	●	●	○	○	○	25 Hz	Default setting
●	●	●	●	○	○	30 Hz	
●	●	●	●	●	○	35 Hz	
●	●	●	●	●	●	40 Hz	

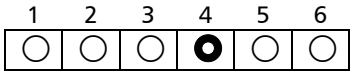
Press (+) or (-) for selecting the value.
To exit the parameter, press (+) and (-) together for 3 seconds.

Driving the pump in a not allowed speed range can damage the motor or the **Hydrovar**-*Watercooled*!

●	Bright	○	Dark	◉	Slow blinking	⦿	Fast blinking

Press (+) to change to the next parameter.

Control window



This adjustment determines the maximum deviation of the operating pressure to the required pressure and also affects the automatic shutoff of the pump at zero demand.

The optimum setting of this parameter depends on the system and the pump type.
A **too small window** can cause oscillation in small hydraulic systems or there is no automatic shutoff at zero demand (the pump starts again also in case of no consumption).
A **too big window** can cause a fluctuating and not constant system pressure also when there is no change in the demand.

Press (+) and (-) together for 3 seconds to choose the parameter.

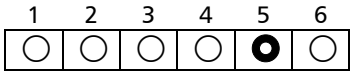
1	2	3	4	5	6	
●	○	○	○	○	○	Setting low
●	●	○	○	○	○	
●	●	●	○	○	○	Default setting
●	●	●	●	○	○	
●	●	●	●	●	○	
●	●	●	●	●	●	Setting high

Press (+) or (-) for selecting the value.
To exit the parameter, press (+) and (-) together for 3 seconds.

Press (+) to change to the next parameter.

●	Bright	○	Dark	◉	Slow blinking	⦿	Fast blinking

Fast Ramps



The fast ramps will be active at starting, stopping and when the output pressure is out of the control window due to big changes in demand. When the actuator-mode is activated, this ramps are also used for starting and stopping.

A too long ramp time can cause a pressure drop or an over pressure during starting, stopping or during operation due to big changes in demand.
A too short ramp time could cause overload (Failure code 46) of the **Hydrovar**-*Watercooled*.

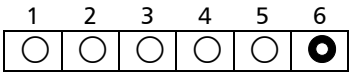
Press (+) and (-) together for 3 seconds to choose the parameter.

1	2	3	4	5	6	
●	○	○	○	○	○	Min. setting
●	●	○	○	○	○	
●	●	●	○	○	○	Default setting
●	●	●	●	○	○	
●	●	●	●	●	○	
●	●	●	●	●	●	Max. setting

Press (+) or (-) for selecting the value.
To exit the parameter, press (+) and (-) together for 3 seconds.

Press (+) to change to the next parameter.

Slow Ramps



These ramps are active during operation when there is nearly constant flow and the output pressure is within the control window. The setting of this parameter is mainly influenced by the type and size of the system and should be adjusted when there is pressure oscillation also at nearly constant demand.

Short ramp times should be selected for small pressure booster systems and longer ramp times should be selected for larger systems.

1	2	3	4	5	6	
●	○	○	○	○	○	Min. setting
●	●	○	○	○	○	
●	●	●	○	○	○	Default setting
●	●	●	●	○	○	
●	●	●	●	●	○	
●	●	●	●	●	●	Max. setting

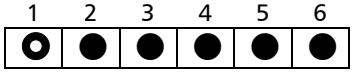
Press (+) or (-) for selecting the value.
To exit the parameter, press (+) and (-) together for 3 seconds.

Press (+) to change to the next parameter.

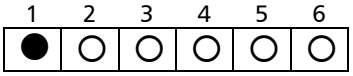
●	Bright	○	Dark	◉	Slow blinking	⦿	Fast blinking

<u>Parameter Level 2:</u> The parameter in that layer can only be activated or deactivated.

<u>Controller or Actuator mode</u>

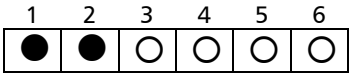


Press (+) and (-) together for 3 seconds to select the parameter.
Press (+) or (-) for changing the status.
To exit the parameter, press (+) and (-) together for 3 seconds.



OFF - Controller-mode:

This mode is the default setting of the **HYDROVAR**-*Watercooled*.

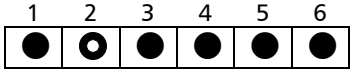


ON - Actuator-mode:

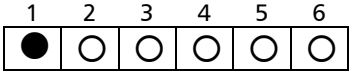
When this mode is selected, the **HYDROVAR**-*Watercooled* starts with the fast ramp to a fixed output frequency.
The thermal protection, external ON/OFF, and all internal protections will be still active in that mode also.

If the mode will be changed all settings of the required pressure or the fixed speed will be deleted and set to 0.
Press (+) to change to the next parameter.

<u>Automatic Failure - Reset</u>



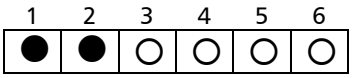
Press (+) and (-) together for 3 seconds to select the parameter.
Press (+) or (-) for changing the status.
To exit the parameter, press (+) and (-) together for 3 seconds.



OFF – No automatic reset in case of a failure

Following failures will be reset every time after eliminating the failure reason, also when this parameter is OFF: Under-voltage, motor over-temperature, sensor error (the integrated pressure sensor will only be supervised when the controller-mode is active. The **HYDROVAR**-*Watercooled* can operate in the Actuator-mode with faulty or without sensor.)

●	Bright	○	Dark	◉	Slow blinking	⦿	Fast blinking



ON – (Default setting) automatic restart of certain failures

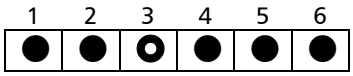
Following failures are included in the Automatic Failure Reset mode:

-) Overvoltage
-) Overload/Overcurrent
if one of these failures happens, the HVW stops and tries to restart after a time delay of 60sec. After the 6th restart the HVW stops definitely and has to be reset by disconnecting the power supply (manual reset).
-) Low Water
if the system pressure drops below 25% of the set point for 20sec., the HVW stops and tries to restart after a time delay of 60sec. After the 3rd restart the HVW stops definitely and has to be reset by disconnecting the power supply (manual reset).

The internal counter of the restarts will be automatically reset to 0 after one operating hour, if no further failure happens.

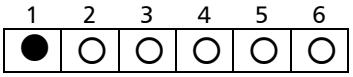
Press (+) to change to the next parameter.

Start value

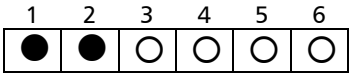


With this parameter you can activate or deactivate a separate starting pressure at 90% of the required pressure after the pump has stopped.

Press (+) and (-) together for 3 seconds to select the parameter.
Press (+) or (-) for changing the status.
To exit the parameter, press (+) and (-) together for 3 seconds.



OFF – The pump will start again when the pressure drops below the control window.



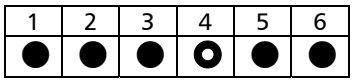
ON – (Default setting) The pump will start again when the pressure drops below 90% of the required pressure.

Example: *Required pressure:* 3,0 bar
Start value: 90% of required pressure = 2,7 bar

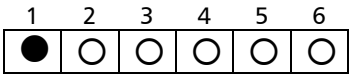
Press (+) to change to the next parameter.

●	Bright	○	Dark	◉	Slow blinking	⦿	Fast blinking

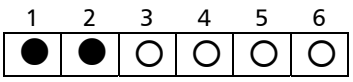
Continuous operation



Press (+) and (-) together for 3 seconds to select the parameter.
Press (+) or (-) for changing the status.
To exit the parameter, press (+) and (-) together for 3 seconds.



OFF – (Default setting): When deactivated, the **Hydrovar**-*Watercooled* will stop the pump at zero demand, where the fast ramps are active below the minimum speed.

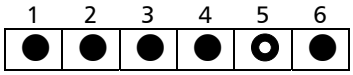


ON – When activated the pump will keep running at minimum speed when the required pressure is reached and there is no automatic shut off of the pump at zero demand. It can only be stopped by opening the external release contact (terminals X4/3 and X4/4) or in the case of a failure.

Driving the pump in a not allowed speed range can damage the motor or the **Hydrovar**-*Watercooled*. Possibility of overheating of the pump and the **Hydrovar**-*Watercooled*, if there is no flow!

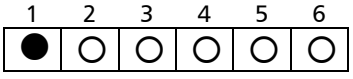
Press (+) to change to the next parameter.

Power reduction

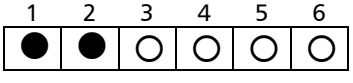


With this parameter an electronic power reduction can be activated to realize a proper overload protection for smaller motors.

Press (+) and (-) together for 3 seconds to select the parameter.
Press (+) or (-) for changing the status.
To exit the parameter, press (+) and (-) together for 3 seconds.



OFF - (Default setting) when the **Hydrovar**-*Watercooled* is connected to a motor with **nominal power of 750W**.



ON – to realize an overload protection when the **Hydrovar**-*Watercooled* is connected to a motor with a nominal power of 550W. (Max. nominal motor current 3,2A)

●	Bright	○	Dark	◉	Slow blinking	⦿	Fast blinking

7 Error Messages

LED-Indication	Failure reason	Possible solution
1 2 3 4 5 6 ○ ○ ○ ○ ○ ◉ **Failure code 06**	**Under Voltage** – Supply voltage is too low	Check the cable and the terminals on the supply side of the Hydrovar
1 2 3 4 5 6 ● ○ ○ ○ ○ ◉ **Failure code 16**	**Processor Error** Software failure	Check the ground and earth connection and the cabling that no signal cable is running in parallel with a power cable
1 2 3 4 5 6 ○ ● ○ ○ ○ ◉ **Failure code 26**	**Low Water** Output pressure is below 25% of the required pressure	The incoming water flow rate or the suction pressure is too low
	Sensor Error	Check cable connection of the internal sensor or changing of the complete pressure measurement device (contact your service partner)
1 2 3 4 5 6 ○ ○ ● ○ ○ ◉ **Failure code 36**	**Over-Temperature Motor/ Over-Temperature Drive** PTC of the motor has detected over-temperature or the **Hydrovar**-*Watercooled* has reached its maximum temperature.	Ambient temperature is too high or cooling of the motor is not efficient. Clean the cover and the motor fan and read the manual of the motor. Temperature of the handled liquid is too high or no flow through the **Hydrovar**-*Watercooled* for efficient cooling.
1 2 3 4 5 6 ○ ○ ○ ● ○ ◉ **Failure code 46**	**Over current / Short circuit Overload** Output current to te motor is too high due to too high nominal power of the motor or short circuit of 2 phases of the motor or the motor cable.	Check the power consumption of the motor and the working point of the pump if they do not exceed the max. output power of the **Hydrovar**-*Watercooled* nominal power - Reduce the flow rate. Check the connection to the motor. Pump is blocked or tight due to solid parts inside the pump
1 2 3 4 5 6 ○ ○ ○ ○ ● ◉ **Failure code 56**	**Over voltage** Supply voltage is too high or spikes on the supply side.	Check the supply voltage level and all connections - If there are spikes on the supply line, use special filters on the input side

After remedy of the failure reason it is necessary to switch on the **Hydrovar**-*Watercooled*.

Please contact your distributor if the same failure occurs more often. Give a detailed description of the error, the failure code and the serial number of the **Hydrovar**-*Watercooled.*

●	Bright	○	Dark	⊙	Slow blinking	◉	Fast blinking

Other failures and possible causes

Failure	Possible cause	Solution
Oscillation of the pressure	Wrong pre-charge pressure in the pressure tank	Adjust pre-charge pressure according to the required pressure or the start pressure when active
	Wrong parameter setting	Optimize control parameters (contact customer service)
	Contaminated or blocked sensor	Clean the internal sensor piping and connection (contact customer service)
Pump does not stop	Wrong pre-charge pressure in the pressure tank	Adjust pre-charge pressure according to the required pressure or the start pressure when active
	Check valve is leaky or mechanically blocked	Clean or change the check valve
	Wrong parameter setting	Increase the control window setting (contact customer service)
	Air in the suction pipe or in the pump	Check the suction pipe, and ventilate the whole system
	Flexible or too long suction line	Larger pressure tank necessary

8 Maintenance and Notes

Zero-Adjustment of the integrated pressure sensor
(Only necessary after change of the sensor)
The **HYDROVAR**-*Watercooled* must be connected to power supply and has to be stopped. Depressurize the system (Manometer shows 0bar) and then press the button for the zero-adjustment on the main board. This new zero point will be saved automatically.

Default values loading
Press (-) until all LEDs are lighting – the 6. LED is blinking (Error LED). After 20 sec. with pressed button the default loading begins it ends with changing to standard display. Button (-) must be pressed until the display changes from the "whole display" to standard display.

The **HYDROVAR**-*Watercooled* does not require any special maintenance!

By maintenance and dismounting be careful that the unit is not on power supply.
Dispose of all packing materials in accordance with local regulations

For further information, please contact your distributor!

9 Manufacturer's Declaration

Manufacturer's Declaration

as defined in EC Machinery Directive 98/37/EEC, Appendix II B and the EMC Directive 89/336/EEC

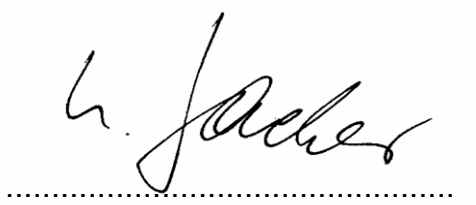
We herewith declare that the frequency converter of type

Hydrovar-*Watercooled*

is intended for assembly with other machines to a machine.
It is forbidden to start using it until it has been established that the machine on this converter is to be installed or with which this converter is to be assembled complies with the provisions of EC Directives.

Relevant technical standards and specifications, especially

EN 61000-4
EN 55011



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Stockerau, 30.08.04

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